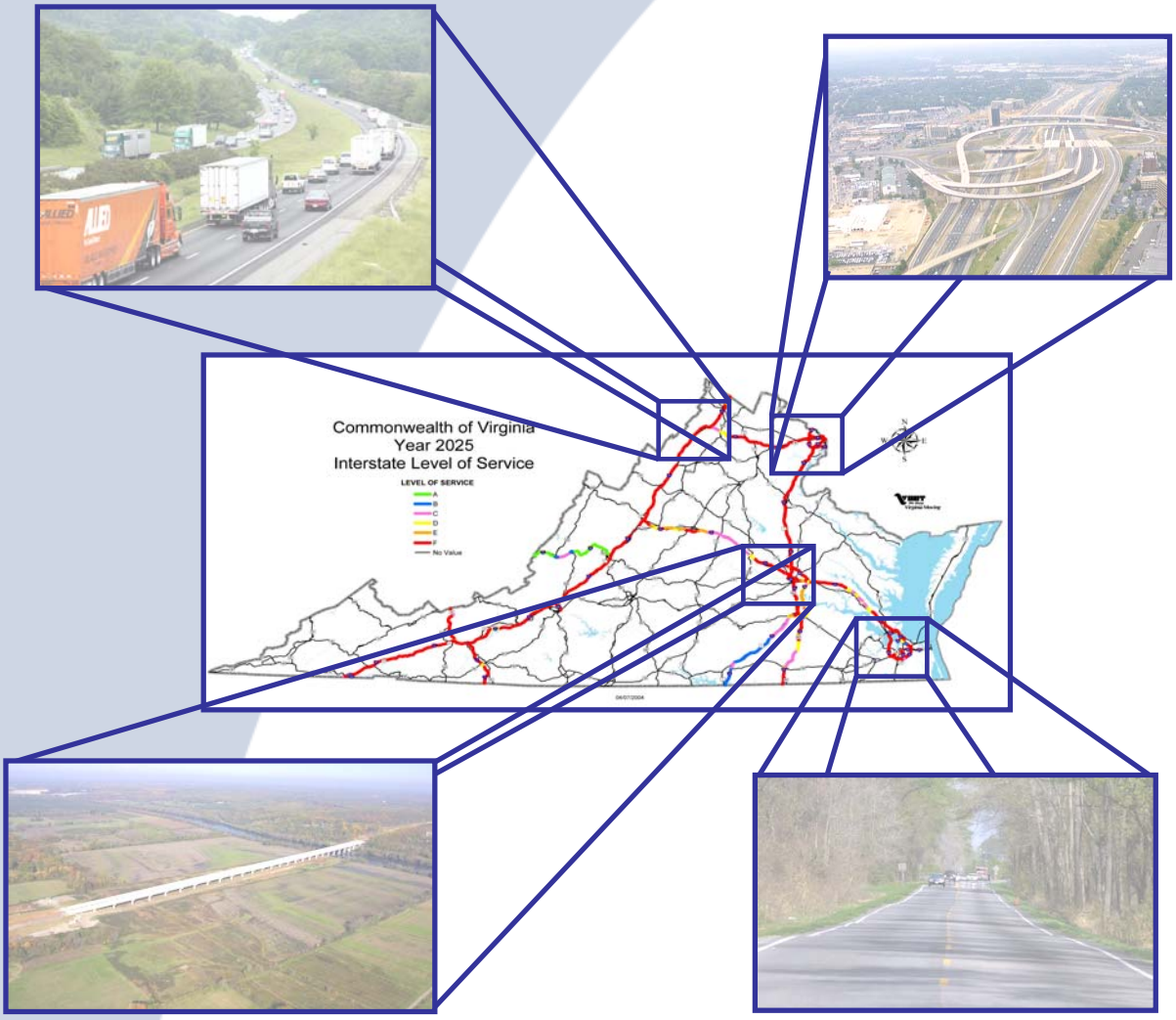
Prioritizing the State Highway Plan



Developing an Effective Transportation Investment Strategy for Virginia's Interstate and Primary Roadways

VDOT Virginia Department of Transportation

Statewide Planning Process

Step One

2025 Highway Needs Assessment

The Highway Needs Assessment is an objective statewide analysis of highway deficiencies and their potential highway solutions.

Step Two

2025 State Highway Plan

Using the Highway Needs Assessment as the foundation for identifying problem areas, planners begin developing a State Highway Plan. Taking into consideration existing local and regional transportation plans, the State Highway Plan contains a list of recommendations for the Interstate and Primary highway systems.

Step Three

Highway Prioritization

Applies specific criteria to recommendations in the Statewide Highway Plan to assist in identifying priorities.

Prioritization
Overview and Purpose

Why develop a prioritization process?

The transportation needs of the Commonwealth continue to increase. Revenues to fund transportation improvements have not kept pace with growing traffic levels. Virginia must continue to find ways to more effectively and efficiently invest the limited funds that are available for transportation.

In addition to these concerns, two independent state organizations, the Auditor of Public Accounts and the Joint Legislative Audit and Review Commission, have stressed the need to develop an objective method to evaluate proposed transportation improvements. The General Assembly of Virginia supported this position in 2002 through the passage of legislation that directed the Commonwealth Transportation Board (CTB) to evaluate transportation needs on a statewide basis and develop priorities.

What is VDOT's goal in developing a prioritization process?

To develop a simple and concise way to evaluate the proposed improvements to Interstate and Primary roadways identified in the State Highway Plan and determine the most effective highway investment strategy for Virginia.

Our Approach

We began by researching the prioritization methods of other state DOTs and metropolitan areas throughout the nation. We focused on existing performance measures and scoring methodologies and used these as a foundation for developing a process that would be sensitive to the needs of Virginia. The states and metropolitan areas we examined included:

Metro Areas
- North Jersey
- Corpus Christi, Texas
- Hampton Roads, Virginia

States
- Alaska
- Delaware
- Ohio

Goals for Prioritization

The following goals serve as the foundation for evaluating proposed highway improvements. Measures were then developed to gauge how well each proposed improvement met each of these goals.

Goal 1: Provide a transportation system that facilitates the efficient movement of people and goods

Goal 2: Provide a safe and secure transportation system

Goal 3: Retain and increase business and employment opportunities

Goal 4: Improve quality of life and minimize potential impacts to the environment

Goal 5: Preserve the existing transportation system and promote efficient system management

Tiering the Proposed Improvements

The State Highway Plan covers over a 20 year timeframe and contains recommendations that not only cover present day needs, but also improvements for problems that are expected to arise within the 20 year planning horizon. One of the first filters applied to the list of proposed recommendations in the State Highway Plan categorizes each proposed improvement into one of three tiers. These tiers are defined as follows:

Tier 1

✓ Capacity deficiency identified within the following timeframe - 2004 – 2011

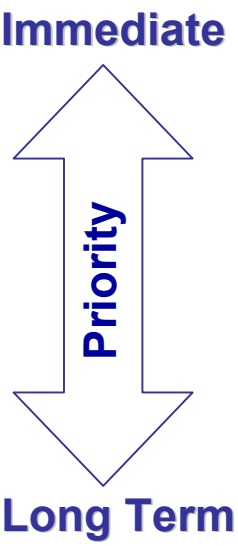
✓ Recommendation addresses an identified safety deficiency

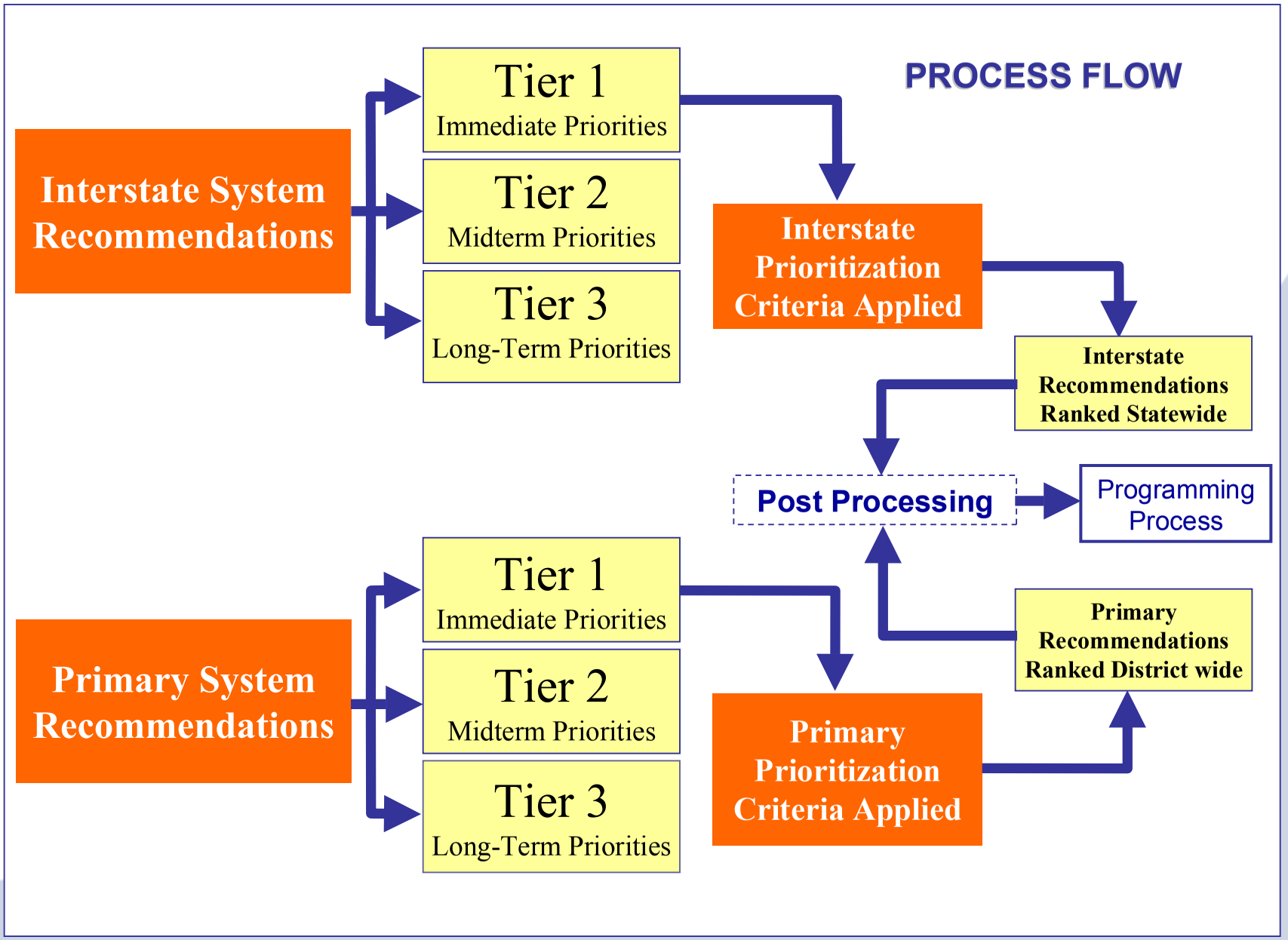
Tier 2

✓ Capacity deficiency identified within the following timeframe - 2012 - 2020

Tier 3

✓ Capacity deficiency identified within the following timeframe – 2021 and beyond




PROCESS FLOW
How Does the Process Work?
Interstate System Recommendations
Tier 1
Immediate Priorities
Tier 2
Midterm Priorities
Tier 3
Long-Term Priorities
Interstate Prioritization Criteria Applied
Interstate Recommendations Ranked Statewide
Post Processing
Programming Process
Primary System Recommendations
Tier 1
Immediate Priorities
Tier 2
Midterm Priorities
Tier 3
Long-Term Priorities
Primary Prioritization Criteria Applied
Primary Recommendations Ranked District wide

Goals and Measures

The following measures were developed to gauge how well each proposed improvement meets each associated goal. These measures are used to assign scores to each proposed improvement in Tier 1. Once scoring is complete, Tier 1 recommendations will be further evaluated to take into account information that cannot be readily modeled or quantified.

Goals and Measures
Goal 1: Provide a transportation system that facilitates the efficient movement of people and goods. > Current Day Level of Service > Current Day Volume to Capacity Ratio > Current Day Passenger Car Equivalents (both directions)
Goal 2: Provide a safe and secure transportation system > Crash rate
Goal 3: Retain and increase business and employment opportunities > Average daily volume of trucks > Local Unemployment Rate
Goal 4: Improve quality of life and minimize potential impacts to the environment > Potential environmental or cultural impacts > Utilization of existing state owned Right-of-Way (ROW)
Goal 5: Preserve the existing transportation system and promote efficient system management > Interchange Spacing/Mainline Adequacy > Inclusion of HOV, bicycle, and/or pedestrian facilities or provisions for other modes > Bridge Conditions – bridge deficiencies based on Bridge Sufficiency Ratings > Cost effectiveness of the proposed recommendation
Bonus Points for Multimodalism > Highway component of an identified VTRANS multimodal investment network (MIN)

Definitions for Prioritization Measures

Current Day Level of Service – refers to the current traffic flow based on service measures such as speed, travel time, freedom to maneuver, traffic interruptions, comfort, and convenience. Level of Service (LOS) qualititatively measures operating conditions of traffic on a roadway as function of variance from ideal conditions.

LOS A reflects free flow conditions while LOS F indicates heavy congestion and travel delays.

Current Day Volume to Capacity Ratio - volume to capacity (V/C) ratio is a simple, accurate, universally recognized measure of congestion. Volume refers to the amount of traffic on a road while capacity refers to the amount of traffic a road can handle. The volume divided by the capacity equals the V/C ratio. A V/C ratio of 1.00 means the roadway segment has reached capacity. Recommendations with high V/C ratios receive more points.

Passenger Car Equivalents – current traffic volume (representing average passenger cars) with adjustment factors for heavy vehicles applied. This measure refers to the total volume of traffic on a roadway segment adjusted to reflect the presence of heavy vehicles including trucks, RV's, and buses.

Crash Rate – reflects the sum of all fatal, injury, and property damage crashes at a specific location. The measure is calculated by dividing the total number of crashes by the annual vehicle miles traveled for three recent calendar years. The crash rate is used to evaluate safety conditions at a project location. Because of the importance of identifying safety issues, this criterion ensures safety is a primary consideration in the development of VDOT projects.

Volume of Heavy Trucks – current total daily volume of heavy trucks (i.e. tractor trailers). Used as an indicator of economic importance of a roadway to the movement of goods throughout the state.

Unemployment Rate – current local unemployment rate of county/city (where the recommendation is located). The underlying implication of this criterion is that transportation investments in economically disadvantaged areas will stimulate economic development.

Potential Environmental Issues – measures how the recommendation may adversely affect the environment. It is based on the presence of seven factors including wetlands, streams, agriculture/forest districts, cultural resources, conservation lands, Virginia Outdoor Foundation easements and endangered species.

Stay within Right of Way Limits – recommendations that stay within right of way minimizes potential community impacts and will receive a higher score for this measure.

Inclusion of Other Modes of Travel – recommendations that include provisions for other modes of travel such as high occupancy vehicle lanes or bicycle /pedestrian facilities are favored under this criterion because they reduce reliance on single occupant vehicles

Bridge Sufficiency Index – the bridge sufficiency index is a rating scale that indicates the structural integrity of a bridge. Bridges with lower bridge sufficiency ratings require increased maintenance and therefore projects that include bridges with lower ratings will receive more points.

Cost per Daily Vehicle Miles Traveled – measures the cost effectiveness of a recommendation. It is calculated by dividing the total estimated cost of a recommendation (in 2025 dollars) by the estimated 2025 vehicle miles traveled (DVMT). DVMT refers to the miles traveled per day on a roadway.

Support of Statewide Multimodal Transportation Plan (VTRANS2025) – Recommendations that have also been identified in the Statewide Multimodal Transportation Plan as priorities will receive additional points in the State Highway Plan prioritization process.

Scoring and Post Processing

Assigning Values and Scoring

VDOT's Transportation and Mobility Planning Division collects data associated with each prioritization measure and conducts a technical analysis to assign scores. Once each measure has been scored, an overall score is calculated for each recommendation.

Selecting Recommendations

Additional Evaluation - Post Processing

Once the scoring is complete, additional considerations will be used to develop a recommended list of improvements for the Commonwealth Transportation Board to consider in developing the next construction program. These include:

- Public feedback from fall planning and programming meetings
- Availability of funding
- Leveraging of funding sources – maximizing the use of federal funds
- Project development considerations – timeframe and extent of federally required location studies
- Project phasing - starting the next phase of a multi-phase roadway improvement

The prioritization process **does not** require that a selected recommendation have a numeric ranking or that VDOT fund projects in order of their ranking. The process is a means to assist the department in evaluating and comparing proposed improvements. The Commonwealth Transportation Board continues to retain final decision making authority on improvements to be included in the construction program.

Next Steps

- This process will be used to identify and propose to the CTB candidate interstate and primary improvements for the next construction program
- The prioritization process will evolve and improve over time
- VDOT will continue to refine and enhance the methodology
- We will continue to develop and incorporate new data sources and measures into this prioritization process